Junos Pulse Secure Access Service

SA Series 4500, 6500, and FIPS Appliances

Release
7.2

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Junos Pulse Secure Access Service SA Series 4500, 6500, and FIPS Appliances
Release 7.2
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Documentation and Release Notes

To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at http://www.juniper.net/techpubs/.

If the information in the latest release notes differs from the information in the documentation, follow the product Release Notes.

Juniper Networks Books publishes books by Juniper Networks engineers and subject matter experts. These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration. The current list can be viewed at http://www.juniper.net/books .

Supported Platforms

For the features described in this document, the following platforms are supported:

- SA6500 FIPS
- SA4500 FIPS
- SA6500
- SA4500

Documentation Conventions

Table 1 on page viii defines notice icons used in this guide.

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Table 1: Notice Icons

Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.

Table 2 on page viii defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the**configure** command: user@host> **configure**
`Fixed-width text like this`	Represents output that appears on the terminal screen.	`user@host>` **show chassis alarms** `No alarms currently active`
Italic text like this	• Introduces or emphasizes important new terms. • Identifies book names. • Identifies RFC and Internet draft titles.	• A policy *term* is a named structure that defines match conditions and actions. • *Junos OS System Basics Configuration Guide* • RFC 1997, *BGP Communities Attribute*
Italic text like this	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# **set system domain-name** *domain-name*
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	• To configure a stub area, include the **stub** statement at the**[edit protocols ospf area area-id]** hierarchy level. • The console port is labeled **CONSOLE**.
< > (angle brackets)	Enclose optional keywords or variables.	**stub <default-metric** ***metric*****>;**

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Table 2: Text and Syntax Conventions *(continued)*

Convention	Description	Examples
| (pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	**broadcast | multicast** **(*string1* | *string2* | *string3*)**
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	**rsvp { # Required for dynamic MPLS only**
[ ] (square brackets)	Enclose a variable for which you can substitute one or more values.	**community name members [*community-ids*]**

Indention and braces ({ })	Identify a level in the configuration hierarchy.	[edit]
		routing-options {
		  static {
		  route default {
		  nexthop *address*;
		  retain;
		  }
		  }
		}

; (semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
J-Web GUI Conventions		
Bold text like this	Represents J-Web graphical user interface (GUI) items you click or select.	• In the Logical Interfaces box, select **All Interfaces**. • To cancel the configuration, click **Cancel**.
> (bold right angle bracket)	Separates levels in a hierarchy of J-Web selections.	In the configuration editor hierarchy, select **Protocols>Ospf**.

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can send your comments to **techpubs-comments@juniper.net**, or fill out the documentation feedback form at https://www.juniper.net/cgi-bin/docbugreport/ . If you are using e-mail, be sure to include the following information with your comments:

- Document or topic name
- URL or page number
- Software release version (if applicable)

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract,

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or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf .
- Product warranties—For product warranty information, visit http://www.juniper.net/support/warranty/ .
- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: http://www.juniper.net/customers/support/
- Search for known bugs: http://www2.juniper.net/kb/
- Find product documentation: http://www.juniper.net/techpubs/
- Find solutions and answer questions using our Knowledge Base: http://kb.juniper.net/
- Download the latest versions of software and review release notes: http://www.juniper.net/customers/csc/software/
- Search technical bulletins for relevant hardware and software notifications: https://www.juniper.net/alerts/
- Join and participate in the Juniper Networks Community Forum: http://www.juniper.net/company/communities/
- Open a case online in the CSC Case Management tool: http://www.juniper.net/cm/

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: https://tools.juniper.net/SerialNumberEntitlementSearch/

Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at http://www.juniper.net/cm/ .
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, see http://www.juniper.net/support/requesting-support.html .

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PART 1

Overview

- Appliances on page 3
- FIPS on page 7

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CHAPTER 1

Appliances

- SA4500 and SA6500 on page 3

SA4500 and SA6500

The SA4500 and SA6500 (SA 4500/6500) are next-generation appliances featuring a number of notable hardware features.

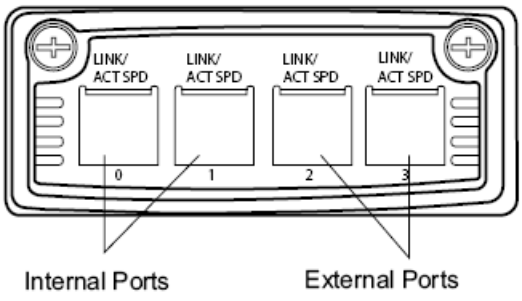
Standard Hardware

The SA 4500/6500 chassis features the following hardware components:

- Console port—You use the console port to initially set up the SA 4500/6500 before you fully integrate it as the secure gateway to your internal network. You can also use the console port to perform certain configuration and clustering tasks after the Secure Access Service begins operating as the secure gateway.
- Bonding ports—By default, on the SA6500 only, the Secure Access Service uses bonding of the multiple ports to provide failover protection. Bonding two ports on the Secure Access Service automatically shifts traffic to the secondary port when the primary port fails.

  The SA6500 appliance bonds ports as follows:

  - Internal port = Port 0+Port 1
  - External port = Port 2+Port 3



The Secure Access Service indicates in a message on the System > Network > Overview page of the administrator admin console whether or not the failover functionality is enabled.

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Bonding ports cannot span separate networks (multi-homed).

- Management port—The SA6500's management port:
  - Enables seamless integration into a dedicated Management Network.
  - Provides continuously available management access to the Secure Access Service.
  - Enables you to perform management activities without impacting user traffic.
  - Allows you to separate administrative access from user access between the Secure Access Service and Enterprise devices on the internal network.

  You can configure the Management port information and advanced settings via the admin console, just as you would configure the internal port.
- SFP ports—4-port Small Form-factor Pluggable (SFP) ports are available as an optional feature for link redundancy to internal switches.
- Status LEDs—Three device status LEDs are located on the left-side of the front panel to display power, hard disk access and fault status.
- Ethernet Port LEDs—The Ethernet port LEDs show the status of each Ethernet port.

The appliance supports up to four node active/active clusters or 2 node active/passive.

SA Series 6500 Field-Replaceable Units

The SA 6500 chassis features three types of field-replaceable units (FRUs) that you can add or replace. The FRUs are "hot-swappable," meaning you do not have to first shut down the SA 6500 before adding or replacing any of the FRUs. The SA4500 has a "cold-swappable" power supply.

For safety information, refer to the *Juniper Networks Products Safety Guide* available on the Juniper Networks Support site.

- **Hard disks**—The SA6500 ships with one hard disk, however, you can add an optional second hard disk to the SA6500 chassis to offer component redundancy and help minimize the Secure Access Service down time. When a second (redundant) hard disk is installed, it maintains an exact copy of the software image and configuration information on the working hard disk. Therefore, if the working hard disk fails, the redundant hard disk immediately assumes responsibility for all Secure Access Service operations. This function is referred to as the Redundant Array of Independent Disks (RAID) mirroring process.

NOTE: **The SA6500 hard disk modules are hot-swappable. You must make sure that the Secure Access Service finishes booting and is operating correctly before removing, replacing, or upgrading a hard disk module. After you insert a new hard disk module, you must wait until the RAID mirroring process is completely finished—which takes approximately 40 minutes—before rebooting or turning off the Secure Access Service.**

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- **Power supplies**—The SA6500 ships with one AC power supply installed in the back of the chassis. You can add an optional second power supply to support redundancy and load-sharing features. In addition, if you need to replace one of the power supplies, you can "swap" the faulty power supply for a replacement while the optional second power supply assumes responsibility for the entire power load, thus avoiding a situation where you have to power off the Secure Access Service before replacing the removable unit.
- **Cooling fans**—The SA6500 ships with two cooling fans installed in the back of the chassis. If you need to replace one of the cooling fans, you can "swap" the faulty fan for a replacement during operation in a matter of moments. You can purchase additional cooling fans from your vendor when you order your SA6500, or you can purchase them in the future to replace faulty or failed cooling fans, as necessary, in the future.

Related Documentation

- Device Status LED Behavior on page 49
- Ethernet Port LED Behavior on page 50
- Replacing the Cooling Fans on page 43
- Replacing a Hard Drive on page 44
- Replacing IOC Modules on page 44
- Replacing a Power Supply on page 46

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CHAPTER 2

FIPS

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- SA FIPS Execution on page 8
- FIPS Overview on page 9

SA FIPS

FIPS, or Federal Information Processing Standards, are National Institute of Standards and Technology regulations for handling keys and encrypting data. Juniper Networks SA FIPS is a standard SA4000 or SA6000 NetScreen Instant Virtual Extranet equipped with a FIPS-certified cryptographic module. The tamper-proof hardware security module installed on an SA FIPS Series Appliance is certified to meet the FIPS 140-2 level 3 security benchmark. The module handles private cryptographic key management and SSL handshakes, simultaneously, ensuring FIPS compliance and off-loading CPU-intensive public key infrastructure (PKI) tasks from the Secure Access Service to a dedicated module.

The configuration process for SA FIPS administrators is almost exactly the same as for the non-SA FIPS administrators, requiring only minor configuration changes during the initialization, clustering, and certificate generation processes. In the few cases where administration tasks are different, this guide includes the appropriate instructions for both SA and SA FIPS administrators. For end-users, SA FIPS is exactly the same as a standard Secure Access Service system.

SA FIPS is a hardware feature that is built into selected Secure Access Services. It is not available on SA700 Series Appliances.

Related Documentation

- SA FIPS Execution on page 8
- Creating Administrator Cards on page 57
- Creating a New Security World on page 17
- Recovering an Archived Security World on page 20
- SA FIPS Execution on page 8

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SA FIPS Execution

When you first install a FIPS system, the Secure Access Service serial console walks you through the process of creating a security world through the serial console. A security world is a key management system used by SA FIPS consisting of the following elements:

- Cryptographic module—The cryptographic module (also sometimes called the hardware security module, or HSM) included with SA FIPS Appliance includes hardware and firmware installed directly on the appliance. A security world may contain a single cryptographic module (standard environment) or multiple modules (clustered environment). However, a single Secure Access FIPS appliance is always equipped with a single cryptographic module.
- Security world key—A security world key is a unique Triple DES encrypted key that protects all other application keys within a security world. As required by the Federal Information Processing Standards, you cannot import this key into a security world—you must directly create it from a cryptographic module. In a clustered environment, all of the modules within the security world share the same security world key.
- Smart cards—A smart card is a removable key device that looks like a credit card. A smart card authenticates users, allowing them access to various data and processes controlled by the cryptographic hardware module. During the initialization process, you must insert one of your smart cards into the reader (built-in or external, depending upon which device model you own). As part of the initialization process, the smart card is transformed into an administrator card that allows the card holder access to the security world.
- Encrypted data—Encrypted host data in a Secure Access FIPS environment includes keys and other data required to share information in a secure manner.

These elements interlock to create a comprehensive security world. When you start the appliance, it confirms that the security world is valid and that the cryptographic module is in operational mode before starting normal operations.

You can set the cryptographic module into operational mode using a hardware switch on the outside of the module. The switch's settings include:

- I—Initialization mode. Use this setting when initializing the cryptographic module with a new security world or when adding a module to an existing security world in a Secure Access cluster. Note that once you set the switch to I and begin initialization, you must complete the process. Otherwise, your security world is only partially initialized, making it unusable.
- O—Operational mode. Use this setting to place the cryptographic module into operational mode after initialization. Note that you must set the switch to O before the module powers up in order to alert the unit that you want to begin day-to-day processing. Otherwise, the module prompts you through the serial console to join the existing security world or initialize a new one.
- M—Maintenance mode. In future releases, this setting will be used to upgrade the firmware on the cryptographic module. (Not yet supported.)

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Related Documentation

- SA FIPS on page 7
- Creating Administrator Cards on page 57
- Creating a New Security World on page 17
- Recovering an Archived Security World on page 20

FIPS Overview

The Juniper Networks SA 4500 and 6500 FIPS is a standard SA4500 or SA6500 appliance equipped with a FIPS-compliant crypto card. The tamper-proof hardware security module installed on a Secure Access FIPS system is certified to meet the FIPS 140-2 level 3 security benchmark.

The configuration process for Secure Access FIPS administrators is almost exactly the same as for the non-FIPS Secure Access administrators, requiring only minor configuration changes during the initialization, clustering, and certificate generation processes. In the few cases where administration tasks are different, this guide includes the appropriate instructions for both Secure Access and Secure Access FIPS administrators. For end-users, Secure Access FIPS is exactly the same as a standard Secure Access system.

The FIPS-compliant crypto card is a host bus adapter card that combines IPsec and SSL cryptographic acceleration with Hardware Security Module (HSM) features. This combination of a dedicated HSM, advanced cryptographic security and secure key management meet the security and performance needs for any service.

This card has two main roles: a security officer and a user role. The FIPS-compliant crypto card replaces the need for administrator cards with the concept of a security officer who is responsible for key and password management. The security officer credential protects the keystore from being exported and imported onto another FIPS-compliant crypto card.

User roles perform cryptographic operations such as accessing keying material within the keystore as well as performing bulk encryption operations.

The security officer credentials, user credentials, and RSA private keys are stored in the HSM encrypted keystore located on the Secure Access disk. You are prompted to provide these credentials whenever any operation requires them. Credentials are not automatically retrieved from the HSM keystore.

Keystores are stored on the disk and are encrypted with a master key. The master key is stored in the cryto card firmware and can be backed up by a security officer using a restore password. This restore password can then be used to restore the master key onto the same or different FIPS-compliant crypto cards allowing the keystore to be shared across a cluster, for example.

Related Documentation

- Name and Password Restrictions on page 15
- Initializing a Keystore on page 31
- Reinitializing the Keystore on page 31

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- Joining a Cluster on page 27
- Importing Device Certificates on page 35
- Changing the Security Officer Password on page 53
- Changing the Web User Password on page 54
- Resetting the HSM Card In Case Of An Error on page 61
- Upgrading the HSM Firmware on page 55
- Binary Importing and Exporting of the Keystore on page 32

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PART 2

Planning

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- Name and Password Restrictions on page 15
- Security World on page 17

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CHAPTER 3

Network Preparation

- Secure Access Appliances on page 13

Secure Access Appliances

Thank you for choosing the Juniper Networks Secure Access Series appliance.

You can install Secure Access and start configuring your system using the following easy steps:

1. Install the hardware
2. Perform basic setup
3. License and configure your Secure Access

NOTE: After installing and setting up your Secure Access, refer to the Initial Configuration task guide in the administrator Web console to install the most current Secure Access OS service package, license your Secure Access appliance, and create a test user to verify user accessibility. To test initial set up and continue configuring your Secure Access, see Getting Started.

We recommend that you install the Secure Access appliance on your LAN to ensure that it can communicate with the appropriate resources, like authentication servers, DNS servers, internal Web servers via HTTP/HTTPS, external Web sites via HTTP/HTTPS (optional), Windows file servers (optional), NFS file servers (optional), and client/server applications (optional).

NOTE: If you decide to install your Secure Access appliance in your DMZ, ensure that the Secure Access appliance can connect to these internal resources.

Related Documentation

- Installing Secure Access Appliance Hardware on page 25
- Basic Setup for Secure Access Appliances on page 37
- Licensing and Configuring Your Secure Access on page 39

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CHAPTER 4

Name and Password Restrictions

- Name and Password Restrictions on page 15

Name and Password Restrictions

Security officer names and usernames must adhere to the following requirements:

Table 3: Security Officer Name and Username Requirements

Security Officer Name and Username Requirement	Description
Minimum Length	At least one character
Maximum Length	63 characters
Valid Characters	Alphanumeric, underscore (_), dash (-) and period (.)
First Character	Must be alphabetic

Passwords must be at least six characters and no more than 63 characters. Three characters must be alphabetic and one character must be non-alphabetic.

Related Documentation

- FIPS Overview on page 9

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CHAPTER 5

Security World

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- Recovering an Archived Security World on page 20

Creating a New Security World

You cannot begin using a Secure Access FIPS machine until you create a security world on it. However, in some case you may need to overwrite that security world with a new one. For example, if you lose an administrator card, we recommend that you create a brand new security world to prevent an untrusted source from finding the card and accessing your security world. You may also need to create a new security world if you cannot remember your original administrator cards pass phrases.

In order to create a new security world, you must have physical access to:

- The cryptographic module(s) that belong to the security world.
- A smart card reader (if you use an older model Secure Access device that does not contain a built-in card reader).
- One or more unformatted smart cards or administrator cards containing data that you can safely overwrite.

NOTE: Your old administrator cards will not work with the new security world until you reformat them with the new security world's data. Also note that once you set the switch to I and begin initialization, you must complete the process. Otherwise, your security world is only partially initialized, making it unusable.

WARNING: You must obtain one or more new device certificates from your CA whenever you create a new security world.

Creating a Security World on a Stand-Alone Secure Access

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To create a new security world on a stand-alone Secure Access:

1. Insert an un-formatted smart card or an administrator card containing data that you can safely overwrite into the card slot with the card contacts facing up.
2. Set the mode switch on the cryptographic module to I (initialization mode).
3. Access the Secure Access serial console and reboot the Secure Access device. After the Secure Access device reboots, you are prompted on the serial console with the following question: **Do you want to use the currently installed security world (y/n)?**
4. Perform one of the following:
   - If you want to create a new security world, then:
     a. Enter n and press Enter.
     b. You are asked to confirm this choice with the prompt "Are you sure you want to delete your existing Security World (including server certificates) (y/n)?". If you choose to continue enter y and press Enter.
     c. Enter the number of administrator cards you want to create and press Enter.
     d. Enter y and press Enter to confirm the number of cards you want to create.
   - If you want to use the currently installed security world, then:
     a. Enter y and press Enter.
     b. Proceed to the next numbered step in this procedure.
5. Reset the cryptographic module's mode switch to O (operational mode).
6. Add the common name and company name when prompted. The system uses the existing self-signed certificate temporarily.
7. Create a new device certificate that shares the new security world's private key.

WARNING: **You must obtain one or more new server certificates from your CA whenever you create a new security world.**

Creating a Security World in a Clustered Environment

To create a new security world in a clustered environment:

1. Sign in to the admin console of a cluster node. To access a node's admin console, enter its internal IP address followed by "/admin" in a browser. For example:

   https://x.x.x.x/admin

2. On the System > Clustering > Status tab, select the checkbox for all nodes other than the current node in the Cluster Members column and then click **Disable**.
3. Initialize the cluster member with a security world. If this is the first node in the cluster, create a new security world.

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4. Return to the node's System > Clustering > Status tab, select the checkbox next to disabled nodes in the Cluster Members column, and then click **Enable**.
5. Wait for all the cluster members to go into an "Enabled" state.
6. Set the mode switch on the cryptographic modules of cluster members that were earlier disabled to I (initialization mode).
7. Reboot each of these nodes from the serial console.
8. After a node joins the security world, reset its cryptographic module's mode switch to O (operational mode).

Replacing Administrator Cards

You can replace an administrator card by selecting the **Replace Administrator Card Set** option from the serial console. You cannot increase the number of administrator cards in an existing set. If you want to do this, you have to create a new security world which replaces all of the existing cards in a set and allow you to create a set with a larger or smaller number of cards.

NOTE: Replacing administrator cards restarts services on your standalone Secure Access device or cluster.

If you need to replace administrator cards for a security world, you must have physical access to:

- A cryptographic module that belongs to the security world.
- A smart card reader (if you use an older model Secure Access device that does not contain a built-in card reader).
- An administrator card that is pre-initialized with the security world.
- An un-formatted smart card or administrator card containing data that you can safely overwrite.
- The same number of unformatted smart cards or administrator cards as in the original set containing data that you can safely overwrite.

NOTE: If you need to replace administrator cards, you must replace the same number of cards that you first initialized for the security world. You cannot replace a subset of the cards.

NOTE: If you require additional smart cards, please contact your Secure Access Reseller.

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To replace all administrator cards or to create a larger number of cards for a security world:

1. Create a new security world.
2. Choose **Replace Administrator Card Set** from the list of configuration tasks.
3. Enter the pass phrase for the security world.
4. When prompted, insert an un-formatted smart card or an administrator card whose data you can safely overwrite into the smart card reader with the contacts facing up.
5. Enter the additional initialization information for which you are prompted.
6. Repeat steps 4 and 5 for as many cards as you want to create.
7. Store at least one of the administrator cards in a secure location.

Related Documentation

- Recovering an Archived Security World on page 20

Recovering an Archived Security World

In rare cases, you may need to recover your system using an archived security world. The archived security world may be an older version of the security world that already exists on your system or the same version. In order to recover your system, you must have access to the system configuration file (by default, system.cfg) that holds the archived security world and its corresponding certificate.

In addition, if you are overwriting your security world with a different security world, you must have physical access to:

- All of the cryptographic modules that belong to the security world.
- A smart card reader (if you use an older model Secure Access device that does not contain a built-in card reader).
- An administrator card that is pre-initialized with the security world and administrator passphrase that you want to import.

Importing a Security World Into a Stand-Alone Secure Access Device

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To import an existing security world into a stand-alone Secure Access device:

1. Import the system configuration file that contains the archived security world and its corresponding certificate into the Secure Access device, and then initialize the security world if necessary. If the configuration file contains an archive of:
   - The same security world that was already present on the machine, no further configuration is required.
   - A different security world than was already present on the machine, you must initialize the new security world.

   NOTE: If you import a configuration file containing a different security world, note that your existing administrator cards will not work with the imported security world until you reformat them with the new security world's data. Also note that once you set the switch to I and begin initialization, you must complete the process. Otherwise, your security world is only partially initialized, making it unusable.
2. Insert an administrator card that is pre-initialized with the imported security world into the smart card reader slot with the contacts facing up.
3. Set the mode switch on the cryptographic module to I (initialization mode).
4. Access the Secure Access device's serial console and reboot the Secure Access device.
5. Reset the cryptographic module's mode switch to O (operational mode) when prompted.

Importing a Security World Into a Cluster

To import an existing security world into a cluster:

1. Sign in to the admin console of a cluster node. To access a node's admin console, enter its internal IP address followed by "/admin" in a browser. For example:

   https://x.x.x.x/admin
2. On the System > Clustering > Status tab, select the checkbox for all nodes other than the current node in the Cluster Members column and then click **Disable**.
3. Import an archived security world in to the cluster member.
4. When the installation process completes, return to the node's System > Clustering > Status tab, select the checkbox next to the disabled nodes in the Cluster Members column, and then click **Enable**.
5. Wait for all the cluster members to go into the "Enabled" state.
6. Set the mode switch on the cryptographic modules of cluster members' that were earlier disabled to I (initialization mode).

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7. Reboot each of these nodes from the serial console.
8. After a node joins the security world, reset its cryptographic module's mode switch to O (operational mode).

Related Documentation

- Creating a New Security World on page 17

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PART 3

Installation

- Hardware on page 25
- Clusters on page 27
- Keystores on page 31
- Device Certificates on page 35
- Initial Configuration on page 37

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CHAPTER 6

Hardware

- Installing Secure Access Appliance Hardware on page 25

Installing Secure Access Appliance Hardware

The Secure Access 2500, 4500 and 6500 ship with mounting ears and mid-mounts. The Secure Access 6500 includes rear mounting rails for use in a four-post mounting rack. We recommend you use the rear mounting rails when installing the Secure Access 6500 in a rack.

If you require an additional mounting kit, contact Juniper Networks.

Next, connect the included cables and power on the Secure Access appliance following these steps:

1. On the front panel:
   a. Connect an Ethernet cable from one of the Ethernet ports on the device to a Gigabit switch port set to 1000BaseTX.

      NOTE: **DO NOT use autoselect on either port.**

      Once you apply power to the Secure Access device, the port uses two LEDs to indicate the connection status,

   b. Plug the serial cable into the console port.
2. On the rear panel, plug the power cord into the AC receptacle. There is no on/off switch on Secure Access. Once you plug the power cord into the AC receptacle, Secure Access powers up.

Hardware installation is complete after you rack-mount the appliance and connect the power, network, and serial cables. The next step is to connect to the appliance's serial console using bonding.

By default, on the SA 6500 only, Secure Access uses bonding of the multiple ports to provide failover protection. Bonding describes a technology for aggregating two physical ports into one logical group. Bonding two ports on Secure Access increases the failover

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capabilities by automatically shifting traffic to the secondary port when the primary port fails.

The SA 6500 appliance bonds ports as follows:

- Internal port = Port 0+Port 1
- External port = Port 2+Port 3

Secure Access indicates in a message on the System > Network > Overview page whether or not the failover functionality is enabled.

Related Documentation

- Secure Access Appliances on page 13
- Basic Setup for Secure Access Appliances on page 37
- Licensing and Configuring Your Secure Access on page 39

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CHAPTER 7

Clusters

- Joining a Cluster on page 27
- Deploying a Cluster in a Secure Access FIPS Environment on page 28

Joining a Cluster

Joining a cluster involves using both the admin console and serial console. To join a cluster:

1. If you have not already done so, define and initialize a cluster

   If you are currently running stand alone appliances that you want to cluster, we recommend that before you create a cluster, you first configure system and user settings on one machine. After doing so, use the same machine to create the cluster. This machine joins the cluster as part of the creation process. When other Secure Access devices join the cluster, this machine propagates its configuration to the new cluster member.

2. Before you can add an appliance to a cluster, you need to make its identity known to the cluster.

3. Join the appliance to the cluster through the admin console or through the serial console.

   - When joining a node to a cluster using the serial console, you are prompted for the cluster keystore's restore password. If the restore password fails, enter 9 to select FIPS Option and then enter 1 to select Complete import of keystore and server certificates.

   When a cluster is created on a node, the node's keystore becomes the cluster's keystore. Any node joining the cluster must import the cluster's keystore. You need the current keystore restore password to do this.

4. When you see the message confirming that the machine has joined the cluster, click the System > Clustering > Cluster Status tab in the admin console of any active cluster member.

5. When all nodes have exited from the "Transitioning" state, connect to the serial console of each node that has a non-CL license and enter 9 to select FIPS Options and then 1 to select Complete import of keystore and server certificates.

6. Enter the cluster keystore restore password.

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Related Documentation

- FIPS Overview on page 9

Deploying a Cluster in a Secure Access FIPS Environment

In addition to sharing state, user profile, user session, and monitoring state data, the members of a Secure Access FIPS cluster also share security world data. All cluster members share the same private key and are accessible using the same administrator cards. Since changing a security world requires physical access to a cryptographic module, however, Secure Access FIPS cluster members cannot share all of their data using the standard Secure Access synchronization process. Instead, to create a Secure Access FIPS cluster, you must:

- Create a cluster of Secure Access FIPS machines through the admin console—As with a standard Secure Access cluster, each cluster node in a Secure Access FIPS cluster is initialized using system state data from the specified cluster member, overwriting all existing data on the node machine.
- Manually update the security world on each of the machines—After creating a cluster, you must initialize each cluster node with the specified member's security world using an administrator card that is pre-initialized to the security world and the serial console. Prior to joining a cluster, each node is in its own security world. As a consequence, after a node joins the cluster, the administrator card from the joining node will be invalid. Only the administrator card set from the cluster will be valid.

Similarly, if you want to modify an existing security world on a cluster, you must individually update each cluster member's cryptographic module using an administrator card and the Secure Access serial console.

The basic process for creating a cluster follows these high-level steps:

1. Initialize one Secure Access from the serial console, creating administrator cards.
2. Create the cluster from this Secure Access' admin console.
3. Add nodes to the cluster from this Secure Access' admin console.
4. Reboot the joining node from the serial console.
5. When prompted, supply the cluster details, including the current node's IP address, netmask, and domain.
6. When prompted, insert an administrator card from the cluster's set of cards. The node's administrator card, if any, will become invalid as the node joins the security world of the cluster.

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To initialize a FIPS cluster member's security world via the serial console:

1. Insert an administrator card that is pre-initialized with the active cluster member's security world into the smart card slot with the contacts facing up.

   NOTE: If you have already performed the procedures required to configure the FIPS appliance, as described in the Quick Start Guide, you might be able to skip this step.

2. Switch the cryptographic module's mode switch to I (initialization mode) if it is not already in that position.
3. Connect to the machine's serial console.
4. Cycle the power to reboot the machine and watch its serial console. After the system software starts, you will see a message that the machine is about to boot as a stand-alone Secure Access and to hit Tab for clustering options. Press the Tab key as soon as you see this option.

   NOTE: The interval to press the Tab key is five seconds. If the machine begins to boot in stand-alone mode, wait for it to finish and then reboot again.

5. Enter the number 2 to join the existing cluster or 1 to continue as a standalone Secure Access.
6. Enter the initialization information as prompted, including:
   - Cluster name
   - Cluster password
   - IP address of a node in the cluster
   - IP address of the node you are adding
   - Netmask
   - Gateway IP address

   NOTE: After you initialize members of a Secure Access FIPS cluster with the same security world, you may disable and re-enable the cluster through the admin console. You are no longer required to use the serial console once the cluster members are all members of the same security world.

7. Select 1 to continue joining the cluster.
8. After the FIPS appliance initializes the card, switch the cryptographic module's mode switch to O (operational mode).

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Related Documentation

- Using the Serial Console

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CHAPTER 8

Keystores

- Initializing a Keystore on page 31
- Reinitializing the Keystore on page 31
- Binary Importing and Exporting of the Keystore on page 32

Initializing a Keystore

When the FIPS appliance is powered on from a factory-reset or when its configuration is reset, the serial console requires the initialization of a keystore and a self-signed device certificate. The steps for initialization are:

- During the boot process, the current release's HSM firmware is installed on the FIPS-compliant crypto card HSM.
- You are prompted to create a new keystore. As part of the new keystore creation, you must provide the following data:
  - The security officer name and password. Save these credentials as they are required for such tasks as creating new restore passwords and for changing the security officer password.
  - The keystore restore or HSM master key backup password. Every time you export the system configuration, save the current restore password for the archived keystore.
  - Web username and password for running cryptographic operations using keys stored in the HSM's keystore.
- The self-signed certificate creation proceeds as normal except that the HSM is used to generate a secure RSA private key which is stored in the HSM's database.

Related Documentation

- FIPS Overview on page 9

Reinitializing the Keystore

If there is a change in the security policy of the deployment that requires the creation of new RSA key pairs and corresponding certificates, you will need to reinitialize the keystore. You can reinitialize the keystore from either a stand-alone node or from a cluster.

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To reinitialize the keystore from a stand-alone node:

1. Reboot the stand-alone node.

   During the boot process, you are prompted to re-initialize the keystore.

2. Press y to delete the current keystore and server certificates.

NOTE: If you do not press y within 10 seconds, the appliance will proceed to boot normally.

To reinitialize the keystore from a cluster:

1. Reboot a node within the cluster.

   During the boot process, you are prompted to re-initialize the keystore.

2. Press y to delete the current keystore and server certificates. A new keystore is initialized.

NOTE: If you do not press y within 10 seconds, the appliance will proceed to boot normally.

3. On the node that you rebooted, open the cluster status page in the admin console and wait for all nodes to exit from the “Transitioning” state.
4. For all other nodes in the cluster, connect to the serial console and enter 9 to select FIPS Options and then 1 to select Complete import of keystore and server certificates.
5. Enter the restore password when prompted.

Related Documentation

- FIPS Overview on page 9

Binary Importing and Exporting of the Keystore

Select **Maintenance > Import/Export** from the admin console to import and export the keystore. You can do this from a stand-alone node or from a node within a cluster. The keystore is exported as part of the system settings configuration file. Safely store the restore password associated with the archived keystore as you will need it for various FIPS operations. If you forget the restore password you can create a new one from the serial console and then re-export the configuration.

To import the keystore, select the **Import Key Store and Device Certificate(s)** checkbox and import your configuration. After the import process has completed, open a serial console for that FIPS appliance and enter 9 for FIPS Options and then 1 to select Complete import of keystore and server certificates. If the keystore is different from the one installed on the HSM you will be prompted for the keystore’s restore password.

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NOTE: If you reboot the FIPS appliance without performing the serial console step above, you are prompted to import the keystore during the boot process. Enter y to import the keystore. If you do not enter y within five seconds, the FIPS appliance continues to boot normally. If this occurs, perform the serial console step after the FIPS appliance completes its boot process.

If the FIPS appliance is in a cluster, go to each node within the cluster and perform the serial console step above to complete the keystore import process.

Related Documentation

- FIPS Overview on page 9

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CHAPTER 9

Device Certificates

- Importing Device Certificates on page 35

Importing Device Certificates

To import a device certificate, generate a CSR from the appliance and then import its corresponding certificate after it is validated by a CA. Each CSR request generates a new RSA key pair.

NOTE: Device certificates without a CSR request from the appliance cannot be imported.

NOTE: The SA Series FIPS appliance is said to be in a disassociated state when the key store state in the cache and on disk are different. As a security measure, you cannot create or delete a CSR when the appliance is in a disassociated state. The options are grayed-out. To resolve a disassociated state, connect to the serial console and reload the FIPS keystore database (Option 9 > Sub-option 1).

Related Documentation

- FIPS Overview on page 9

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CHAPTER 10

Initial Configuration

- Basic Setup for Secure Access Appliances on page 37
- Licensing and Configuring Your Secure Access on page 39

Basic Setup for Secure Access Appliances

When you boot an unconfigured Secure Access appliance, you need to enter basic network and machine information through the serial console to make the appliance accessible to the network. After entering these settings, you can continue configuring the appliance through the administrator Web console. This topic describes the required serial console setup and the tasks you need.

To perform basic setup:

1. Configure a console terminal or terminal emulation utility running on a computer, such as HyperTerminal, to use these serial connection parameters:
   - 9600 bits per second
   - 8-bit No Parity (8N1)
   - 1 Stop Bit
   - No flow control
2. Connect the terminal or laptop to the serial cable plugged in to the appliance's console port and press Enter until you are prompted by the initialization script.
3. Enter y to proceed and then y to accept the license terms (or r to read the license first).
4. Follow the directions in the serial console and enter the machine information for which you are prompted, including the:
   - IP address of the internal port (you configure the external port through the administrator Web console after initial configuration)
   - Network mask
   - Default gateway address
   - Primary DNS server address

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- Secondary DNS server address (optional)
- Default DNS domain name (for example, acmegizmo.com)
- WINS server name or address (optional)
- Administrator username
- Administrator password
- Common machine name (for example, connect.acmegizmo.com)
- Organization name (for example, Acme Gizmo, Inc .)

NOTE: Secure Access uses the common machine and organization names to create a self-signed digital certificate for use during product evaluation and initial setup. We strongly recommend that you import a signed digital certificate from a trusted certificate authority (CA) before deploying Secure Access for production use. For more information, see Certificates.

5. (FIPS only) The Secure Access FIPS appliances utilize FIPS 140-2 certified Hardware Security Modules (HSM) and require the following pieces of information to initialize the HSM and manage the HSM protected storage:
   - When prompted by the serial console, enter the security officer name and password. Save these credentials as they are required for creating new restore passwords and for changing the security officer password.
   - Enter the key store restore or HSM master key backup password.
   - Enter the username and password for the HSM private key storage.

   Security officer names, usernames and key store names must adhere to the following requirements in Table 4 on page 38:

Table 4: Security Requirements

Requirement	Description
Minimum length	At least one character.
Maximum length	63 characters for security officer names and user names. 32 characters for keystore names.
Valid characters	Alphanumeric, underscore (_), dash (-) and period (.)
First character	Must be alphabetic.

Passwords must be at least six characters. Three characters must be alphabetic and one character must be non-alphabetic.

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6. In a browser, enter the machine's URL followed by "/admin" to access the administrator sign-in page. The URL is in the format: https://a.b.c.d/admin, where a.b.c.d is the machine IP address you entered in step 4. When prompted with the security alert to proceed without a signed certificate, click Yes. When the administrator sign-in page appears, you have successfully connected your Secure Access appliance to the network.
7. On the sign-in page, enter the administrator user name and password you created in step 4 and then click Sign In. The administrator Web console opens to the System>Status>Overview page.

Related Documentation

- Secure Access Appliances on page 13
- Installing Secure Access Appliance Hardware on page 25
- Licensing and Configuring Your Secure Access on page 39

Licensing and Configuring Your Secure Access

After you install Secure Access and perform basic setup, you are ready to install the most current Secure Access OS service package, license Secure Access, verify accessibility, and complete the configuration process:

- To install the most current Secure Access OS service package, license your Secure Access and create a test user to verify user accessibility, follow the task guide embedded in the administrator Web console.
- To test initial set-up and continue configuring your Secure Access, see Getting Started.

Related Documentation

- Secure Access Appliances on page 13
- Installing Secure Access Appliance Hardware on page 25
- Basic Setup for Secure Access Appliances on page 37

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PART 4

Maintenance

- Hardware Replacement on page 43
- LED Behavior on page 49
- Passwords on page 53
- HSM Firmware on page 55
- Administrator Cards on page 57

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CHAPTER 11

Hardware Replacement

- Replacing the Cooling Fans on page 43
- Replacing a Hard Drive on page 44
- Replacing IOC Modules on page 44
- Replacing a Power Supply on page 46

Replacing the Cooling Fans

The SA 6500 ships with two cooling fans installed in the back of the chassis. If you need to replace one of the cooling fans, you can "hot-swap" the faulty fan for a replacement during operation in a matter of moments. You can purchase additional cooling fans from your authorized Juniper reseller, or you can purchase them in the future to replace faulty or failed cooling fans, as necessary.

To remove and install a cooling fan module:

1. To release the cooling fan module, do one of the following:
   - Press and slide the release trigger toward the center of the cooling fan module
   - Loosen the thumbscrews
2. Grasp the cooling fan module and carefully pull it out.

CAUTION: **Once you remove the cooling fan module, it is important that you replace it with a replacement cooling fan. The second fan is required for proper air flow across the chassis's internal components; it is not a redundant fan.**

3. Line the a cooling fan module up with an empty cooling fan port on the back of the chassis.
4. Slowly slide the module into the chassis until it clicks into place.
5. If your cooling fan is equipped with thumb screws, tighten the screws.

Related Documentation

- SA4500 and SA6500 on page 3
- Replacing a Hard Drive on page 44

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- Replacing IOC Modules on page 44
- Replacing a Power Supply on page 46

Replacing a Hard Drive

The SA 6500 ships with two standard hard drives to offer component redundancy and help minimize down time. The second (redundant) hard disk maintains an exact copy of the software image and configuration information on the working hard disk. Therefore, if the working hard disk fails, the redundant hard disk immediately assumes responsibility for all operations. This function is referred to as the Redundant Array of Independent Disks (RAID) mirroring process.

NOTE: **The hard disk modules are hot-swappable. Once a new hard disk module is inserted, you should wait until the RAID mirroring process has completed before rebooting or turning off the appliance.**

To remove and install a hard drive:

1. On the hard drive module, press the blue handle release trigger in and to the right to release the insertion and removal handle.
2. Grasp the handle and pull the hard drive module straight out of the chassis.

   Once you have removed the hard drive module, be sure to replace it with a replacement hard drive.
3. With the insertion and removal handle on the hard drive module in the released/out position, line the hard drive module up with an empty hard drive port on the front of the chassis.
4. Carefully slide the hard drive module into the chassis until it is clicks into place.

Retract the handle by swinging it back across the face of the hard drive until it is completely flush with the face of the hard drive module.

Related Documentation

- SA4500 and SA6500 on page 3
- Replacing the Cooling Fans on page 43
- Replacing IOC Modules on page 44
- Replacing a Power Supply on page 46

Replacing IOC Modules

This section contains information about removing and installing IOC Modules (IOMs) in the SA 6500.

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CAUTION: Power off the device before removing or installing IOMs. IOMs are not hot-swappable.

Removing a Blank IOM Faceplate

To maintain proper airflow through the device, leave blank faceplates in place over slots that do not contain IOMs. Do not remove a blank faceplate unless you are installing an IOM in the empty slot.

To remove a blank faceplate:

1. Unplug the power cord.
2. Loosen the thumbscrews on each side of the faceplate.
3. Grasp the thumbscrews and pull to remove the faceplate.

Installing an IOM

1. Unplug the power cord.
2. Line the IOM up with an empty port on the front of the chassis.
3. Carefully slide the IOM in until it seats firmly in the device.
4. Tighten the screws on each side of the IOM faceplate.
5. Insert the appropriate cables into the cable connectors on the IOM.
6. If necessary, arrange the cables to prevent them from dislodging or developing stress points:
   - Secure the cable so that it is not supporting its own weight as it hangs to the floor.
   - Place excess cable out of the way in a neatly coiled loop.
   - Use fasteners to maintain the shape of cable loops.
7. Insert the power cord into the AC power receptacle.

Removing an IOM

To remove an IOM:

1. Unplug the power cord.
2. Disconnect the cables from the IOM.
3. If necessary, arrange the cables to prevent them from dislodging or developing stress points.
4. Loosen the thumb screws on each side of the IOM faceplate.
5. Grasp the thumbscrews and pull to remove the IOM.

If you are not reinstalling an IOM into the empty slot, install a blank IOM faceplate over the empty slot to maintain proper airflow.

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Related Documentation

- SA4500 and SA6500 on page 3
- Replacing a Hard Drive on page 44
- Replacing a Hard Drive on page 44
- Replacing a Power Supply on page 46

Replacing a Power Supply

Removing and Installing an AC Power Supply

The Juniper Networks appliance ships with one AC power supply installed in the back of the chassis. You can add an optional second power supply to support redundancy and load-sharing features. In addition, if you need to replace one of the power supplies, you can "hot-swap" the faulty power supply for a replacement while the optional second power supply assumes responsibility for the entire power load, thus avoiding a situation where you have to power off the Secure Access Service before replacing the removable unit.

To remove and install an AC power supply module:

1. Press the release trigger in and to the right to release the module.
2. Grasp the insertion and removal handle and pull the power supply module straight out of the chassis.

   Once you have removed the supply module, be sure to replace it with a replacement power supply or the "dummy" power supply port cover installed in your chassis at the time of shipping.
3. Line the new power supply module up with an empty power supply port on the back of the chassis.
4. Slowly slide the power supply module into the chassis until it clicks into place.

Removing and Installing a DC Power Supply

To remove and install a DC power supply module:

1. Unplug the power cord.
2. Disconnect the DC supply wires from the lugs on the DC power supply.
3. Press the release trigger in and to the right to release the module.
4. Grasp the power supply module and pull it straight out of the chassis.
5. Slowly slide the new module into the chassis until it clicks into place.
6. Connect the DC supply wires to the module using the lugs. Be sure to attach the ground wire.
7. Attach the power cord

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Related Documentation

- SA4500 and SA6500 on page 3
- Replacing the Cooling Fans on page 43
- Replacing a Hard Drive on page 44
- Replacing IOC Modules on page 44

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CHAPTER 12

LED Behavior

- Device Status LED Behavior on page 49
- Ethernet Port LED Behavior on page 50
- FIPS Device Status LED Behavior on page 51

Device Status LED Behavior

Startup takes approximately one minute to complete. If you want to turn the device off and on again, we recommend you wait a few seconds between shutting it down and powering it back up.

There are three device status LEDs located on the left-side of the front panel:

- Power
- Hard disk access
- Fault

Table 5 on page 49 lists the name, color, status, and description of each device status LED.

Table 5: Device Status LEDs

Name	Color	State	Description
POWER	Green	Off	Device is not receiving power
		On Steady	Device is receiving power
HARD DISK ACCESS	Yellow	Off	Hard disk is idle
		Blinking	Hard disk is being accessed
FAULT	Red	Off	Device is operating normally
		Slow blinking	Power supply fault
		Fast blinking	Fan failure

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Table 5: Device Status LEDs *(continued)*

Name	Color	State	Description
		Solid	Thermal failure

Related Documentation

- SA4500 and SA6500 on page 3
- Ethernet Port LED Behavior on page 50
- Replacing the Cooling Fans on page 43
- Replacing a Hard Drive on page 44
- Replacing IOC Modules on page 44
- Replacing a Power Supply on page 46

Ethernet Port LED Behavior

The Ethernet port LEDs show the status of each Ethernet port.

Table 6: 4-Port Copper Gigabit Ethernet LEDs (available on IC4500 and IC6500)

LED	Color and State	Description
Link/Activity	Green	Link
	Blinking green	Activity
Link Speed	Off	10 Mbps
	Green	100 Mbps
	Yellow	1 Gbps

Related Documentation

- SA4500 and SA6500 on page 3
- Device Status LED Behavior on page 49
- Replacing the Cooling Fans on page 43
- Replacing a Hard Drive on page 44
- Replacing IOC Modules on page 44
- Replacing a Power Supply on page 46

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FIPS Device Status LED Behavior

There are three device status LEDs located on the FIPS card:

- S (Status)
- F (FIPS)
- I (INIT)

Table 7: Status LED

LED	Color and State	Description
STATUS	Off	Bootstrap firmware is executing
	Blinking green	IDLE, OPERATIONAL, or FAILSAFE state
	Green	POST or DISABLED state (driver not attached)
	Blinking red	Error occurred during boot process
	Red	HALTED (fatal error) state or when a low-level hardware initialization failure occurred
FIPS	Off	Operating in non-FIPS mode
	Green	Operating in FIPS mode
	Blinking yellow	Zeroize jumper is present
INIT	Off	Board is not initialized
	Green	Board initialized by security officer
	Yellow	POST, DIAGNOSTIC or FAILSAFE (firmware not upgraded) state
	Blinking yellow	Running diagnostics

Related Documentation

- FIPS Overview on page 9

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CHAPTER 13

Passwords

- Changing the Security Officer Password on page 53
- Changing the Web User Password on page 54

Changing the Security Officer Password

Occasionally you may want to change the security officer password. In a cluster, you can perform this operation from any node. The new security officer password is updated to the other nodes automatically.

NOTE: **Changing the security officer password restarts the web server.**

To change the security officer password:

1. Connect to the serial console of the FIPS appliance you want to reset.
2. Enter 9 to select FIPS Option.
3. Enter 2 to select Change security officer password.
4. Enter the existing security officer password.
5. Enter the new password.
6. Re-enter the new password when prompted to confirm.

NOTE: **The SA Series FIPS appliance is said to be in a disassociated state when the key store state in the cache and on disk are different. As a security measure, you cannot change the security officer password when the appliance is in a disassociated state. The option is disabled. To resolve a disassociated state, connect to the serial console and reload the FIPS keystore database (Option 9 > Sub-option 1).**

Related Documentation

- FIPS Overview on page 9

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Changing the Web User Password

The web username and password are used to securely store the RSA private keys in the HSM's encrypted database. These credentials are used by the Secure Access Service processes to carry out RSA operations. The keys will never be available for use outside the HSM. You can later change the web password but not the web username.

In a cluster, you can perform this operation from any node. The new password is updated to the other nodes automatically.

NOTE: **Changing the web user password restarts the web server.**

To change the web password:

1. Connect to the serial console of the FIPS appliance you want to reset.
2. Enter 9 to select FIPS Option.
3. Enter 3 to select Change web user password.
4. Enter the existing web user password.
5. Enter the new password.

NOTE: **The SA Series FIPS appliance is said to be in a disassociated state when the key store state in the cache and on disk are different. As a security measure, you cannot change the web user password when the appliance is in a disassociated state. The option is disabled. To resolve a disassociated state, connect to the serial console and reload the FIPS keystore database (Option 9 > Sub-option 1).**

Related Documentation

- FIPS Overview on page 9

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CHAPTER 14

HSM Firmware

- Upgrading the HSM Firmware on page 55

Upgrading the HSM Firmware

Some system software upgrades may also require firmware updates. Typically, firmware upgrades occur during the boot process. After the system software updates, the serial console prompts you for the keystore restore password before upgrading the HSM's firmware. If you do not remember the password, you have the option of upgrading the firmware at a later date using the serial console. Note that the web server may not function properly if the firmware upgrade is required and is not updated.

To upgrade the firmware using the serial console:

1. Click **System > Clustering > Cluster Status** tab in the admin console and wait for the node to be in the "FIPS disassociated" state.
2. Open a serial console and enter 9 to select the FIPS option.
3. Enter 6 to select Load Firmware.

NOTE: The SA Series FIPS appliance is said to be in a disassociated state when the key store state in the cache and on disk are different. As a security measure, you cannot load firmware when the appliance is in a disassociated state. The option is disabled. To resolve a disassociated state, connect to the serial console and reload the FIPS keystore database (Option 9 > Sub-option 1).

Related Documentation

- FIPS Overview on page 9

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CHAPTER 15

Administrator Cards

- Creating Administrator Cards on page 57

Creating Administrator Cards

When you receive your Secure Access FIPS product, you receive 6 smart cards as part of the package. A smart card is a removable key device that you must use in order to gain access to some of the critical data and processes controlled by the cryptographic module. Secure Access FIPS first requires you to use one of your smart cards while initializing the cryptographic module through the serial console. During this process, Secure Access FIPS creates a security world and transforms the smart card into an administrator card that gives the holder access only to that security world.

Once the module is initialized, you do not need the administrator card for normal Secure Access operations. However, you are required to use the administrator card whenever you want to add another Secure Access FIPS machine to a cluster, reinitialize a module with a new or different security world or replace administrator cards.

As a rule-of-thumb, any Secure Access FIPS operation that you must execute through the Secure Access serial console requires an administrator card.

NOTE: Whenever you change your security world, you must determine how to handle your existing administrator cards. Your choices include:

- Reset your existing administrator cards to the new security world.
- Use administrator cards that are pre-initialized to the new security world and leave your existing administrator cards unchanged. Note that if you choose this option, however, you cannot use the old, unchanged cards to access the new security world.

Administrator Card Precautions

Since administrator cards are so critical to Secure Access FIPS operations and the security of the keys within your security world, we strongly recommend that you take the following precautions:

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- Create multiple administrator cards—You cannot replace an administrator card unless you have another valid card and the pass phrase for that card; the cryptographic module does not store administrator card recovery data. Therefore, we strongly recommend that you create at least one administrator card for standard administrative operations and another for backup purposes. Otherwise, you run the risk of losing your only administrator card and subsequently losing access to your security world and all the data it stores. You can only create a set of administrator cards, all at once. You cannot add additional cards to an existing set.
- Store a backup administrator card in a secure location—Always keep your backup administrator card(s) in a secure location separate from the card you use for standard administrative operations to ensure that you do not lose all of your administrator cards to the same event (such as a fire or theft).
- Overwrite all remaining administrator cards if one gets lost—If you lose or damage an administrator card, immediately create a new security world and overwrite all remaining cards from the old security world. Otherwise, an attacker with an old administrator card may be able to access old host data stored on a backup tape or another host. With the old host data and an old card, the attacker may then be able to re-create your keys.
- Protect the administrator card's pass phrase—For maximum security, you should never write down your pass phrase, tell it to untrusted users, or use a pass phrase that is easy to guess. Protecting your pass phrase adds an extra level of security to your operations.
- Only use your administrator card with known, trusted sources—Always obtain smart cards from a trusted source, never insert a smart card into an untrusted smart card reader, and never insert untrusted smart cards into your smart reader.

Related Documentation

- SA FIPS on page 7
- Creating a New Security World on page 17
- Recovering an Archived Security World on page 20

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PART 5

Troubleshooting

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CHAPTER 16

HSM Card

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Resetting the HSM Card In Case Of An Error

If the FIPS card LEDs indicates an error or fault, try resetting the HSM card prior to rebooting your appliance.

To reset the HSM card:

1. Connect to the serial console of the FIPS appliance you want to reset.
2. Enter 9 to select FIPS Option.
3. Enter 5 to select Reset the HSM.
4. Observe the LEDS on the FIPS card. If they do not eventually turn green, reboot your appliance.

Related Documentation

- FIPS Overview on page 9

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PART 6

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